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THE ROLE OF ENVIRONMENTAL NGOS IN CLEANER INDUSTRIAL PRODUCTION*

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*The views expressed in the present document are those of the author and do not necessarily reflect the views of the UNIDO Secretariat. This document has not been edited.

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Preface

Greenpeace International is an environmental pressure group which started its activities in 1971. The organisation is not allied to any political party and acts independently of any government, business interest, group or individual. Greenpeace International is funded by donations from over 4 million people in 158 countries. It embraces the principle of non-violence and rejects the use of physical force against people or property.

Greenpeace International's involvement in clean production includes the organisation of a campaign against toxic trade in Central and Eastern Europe, mainly in Poland, tracking foreign aid and investment, exposing waste trade schemes, the transfer of misguided western technologies and unwanted products. Greenpeace International campaigns for the adoption of clean production (see report "Poland the Green Tiger and Europe? Clean Production -The Only Way Forward") by highlighting the opportunities for clean production that exist especially in countries with economies in transition.

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Introduction

1. As the environmental movement in the West matures and environmental issues increasingly become part of mainstream government and industrial policies, so the role of the movement is changing. Environmental organisations today are not only exposing environmental problems but increasingly focusing on promoting alternatives.

2. Environmental problems are escalating. Most are caused by industrial production and consumption systems which squander resources - materials and energy - leading to their depletion and industrial emissions and waste. The unsustainable use of renewable resources and toxic substances in production processes reduces biodiversity and poses a threat to environmental and human health.

3. The response of governments to public pressure demanding action to stop further environmental degradation has been to set emission standards for various pollutants. Industry efforts, in turn, have focused on installing end-of-pipe technologies, such as filters and flue gas desulphurisation units, to achieve emission goals.

4. The continuing degradation of the environment has shown this "pollution control" approach to environmental management to be seriously flawed. Pollution has not been prevented, but instead has been moved between water, air and soil. For instance, contaminated filters are dumped in landfills where they poison both soil and, ultimately, groundwater.

5. Although much has been said about the need for sustainable development, strategies to get there have been poorly promoted, much less implemented. Greenpeace considers Clean Production to be one of the best developed strategies to provide the paradigm to put society on the path to sustainability by changing industrial practices worldwide.

The key elements of Clean Production are:

* precaution
* prevention
* democracy
* integration and holism
* environmental, social and economic cost-benefit analysis

6. The role of environmental groups is to keep the move toward Clean Production dynamic and on course. Progress toward this goal must be closely monitored to avoid another environmental cul-de-sac, such as the end-of-pipe approach of the 1970s.

7. The first part of the paper examines the role of environmental groups in working with the public. The second part highlights the importance of international NGO networking. The third section examines their role in working with national and international institutions. The paper ends with a series of recommendations both to governments and industry.

I. WORKING WITH THE PUBLIC

8. Public participation in political and economic decision-making is one of the cornerstones of the Clean Production approach. It challenges the right of industry and scientists to impose polluting production technologies and the locations to pollute.

9. Expanding global trade and investment renders transnational companies more mobile and national Governments less potent; so this may be a tall order.

10. However the situation is not hopeless. Controversy during the Brent Spar campaign about the amount of toxics being dumped failed to mask the real root of the problem - the environmentally damaging design of the oil storage buoy.

11. The campaign proved that the power of public pressure can stimulate the type of public debate that highlights and challenges Governments' right to allow companies to dump their waste in the global commons of the North Atlantic instead of insisting on environmentally sound design criteria. Public outcry at incidents like this will inevitably lead to demand for life cycle assessment of all industrial products and processes at an early stage of development, from oil platforms to nuclear power plants.

12. Another lesson for industry is that it is no longer enough for companies to rely on Government policymakers and regulators alone to ensure societal approval for environmentally controversial decisions. They now need to consult a growing range of environmental 'stakeholders'.

13. Brent Spar showed that companies taking difficult decisions can no longer count on each other to stay silent if their consciences dictate taking a stand. The campaign split Shell revealing a wide chasm in environmental awareness between Shell Germany and that in Shell UK.

A. Public Access to Information: The Key to the Implementation of Clean Production

14. Environmental groups and the public can have an increased input in decisions relating to industrial production when information regarding processes and products is readily available. One of the aims of the environmental movement worldwide is improved information disclosure.

15. The U.S. Toxic Release Inventory (TRI) illustrates the public empowerment that this can provide.

B. The U.S. Toxic Release Inventory

16. The U.S. Emergency Planning and Community Right to Know Act, of 1986, stipulates that annual reports of emissions must be prepared by companies which use, over a threshold quantity, any of the 300 plus listed chemicals. These reports, which make up the Toxic Release Inventory (TRI) are actively disseminated by the USEPA (US Environmental Protection Agency) to the public.

17. The USEPA has on-going input from the Working Group on Right-to-Know to evolve the TRI into a better tool. The US recently passed legislation to make the reporting of pollution prevention measures mandatory. Current US NGO lobbying is aimed at expanding the TRI to list a further 300 chemicals and also to have it changed to a Toxic USE Inventory which would provide information about hazardous chemicals in the products themselves.

18. Since the passage of the Act, industry, government and public groups have unanimously claimed its success. The effects are summarised below:

* *It has empowered communities by providing specific information about companies in their neighbourhoods, enabling them to gauge their performance.*

* *It has increased company accountability.*

* *The tracking of trends help groups to focus on why pollution prevention measures are not being used.*

* *TRI data on methods of source prevention has helped groups lobby for pollution prevention in a more credible fashion.*

C. The Pollutant Release and Transfer Register

19. The OECD is currently facilitating a series of workshops to establish a Pollutant Release and Transfer Register (PRTR), with the objective of creating an international register modelled on the TRI. The aim of the workshops is to prepare a "Guidance to Governments Document" on the design and implementation of a PRTR to be published in December 1995. This is in answer to Agenda 21's call for more public information on environmental emissions.

20. Environmental NGOs are taking part in this process. It is crucial that the PRTR does not focus on emission data only, but adopts mass balance accounting procedures (ie. what goes in must come out audit) similar to the New Jersey and Massachusetts toxic use reduction laws. Otherwise, cross-media transfer of toxins will escalate, and the goals of clean production will not be served.

D. Other sources of Environmental Data

21. Emission registers, however, are essentially reactive instruments. They examine only what comes out at the end of the pipe, rather than looking upstream in the production process.

22. Environmental groups need also to promote the use of more proactive environmental tools. This requires their active input into planning processes to ensure the proper use of environmental impact assessments (EIA) and audits.

23. A thorough EIA process should not only highlight potential environmental problems but should also be used to generate alternatives to the proposed project. The need and purpose of the proposed project must be questioned to allow alternatives to be considered or, indeed, to propose a no-action alternative.

24. Furthermore, emissions registers provide no information on energy use, or the volume and speed of material flows in production-consumption systems. Ultimately, mass balance accounting of both materials and energy used in production systems must evolve as standard practice.

25. In an effort to quantify national sustainability, some countries have examined their 'carrying capacities' - a measure used to assess the optimum population that an ecosystem can sustain without loss of structure or stability. Mass balance accounting at local, regional and national level - and ultimately internationally - can enable society to gauge its progress towards sustainability.

E. Public Education to spearhead change

26. The Clean Production (CP) approach has yet to be widely implemented. The hurdle is not a lack of physical or technical capability, but the lack of industrial and political will to implement CP methods. This inertia is due to the absence of public pressure. Governments and industry will only act if they are informed about the choices available to them and feel some pressure from society.

27. Today, the CP dialogue and development is taking place within a tight circle of engineers and academics. The development of radical CP ideas is happening outside the formal international network. For example, much of the development of tree-free paper, alternative building materials and energy devices is coming from small public groups.

28. There needs to be more information on the alternatives available. This requires not only highlighting cleaner technologies and products on a case-by-case basis, but also promoting clear legislative and economic strategies to underpin a more widescale change. Examples of strategies which are being discussed in some West European countries include extended producer responsibility (EPR) also known as 'take-back' and the concept of economic tax reform (ETR).

29. EPR imposes an obligation on the producers of goods to take back their used products at the end of their useful life. The objective of ETR is to correct the distortions in current taxation systems which favour taxing labour instead of resources. This would shift taxes from

labour by reducing, for example, income tax and introducing taxes on energy and environmentally destructive materials or products. Both instruments would complement each other, resulting in less use of resources through better product design and more use of labour in the dismantling, re-use and repair of products, thus cutting unemployment.

30. This can only be achieved if these instruments are correctly designed and implemented. Environmental groups must monitor and influence these developments.

F. Greenpeace proposes Ecological Tax Reform

31. Political support for "eco-tax reform" (ETR) came from all parties in the 1995 German elections. The German debate on tax reform was provoked by a study prepared by the influential German Economic Research Institute (DIW) and commissioned by Greenpeace. The study showed that a unilateral ETR programme that raised energy prices by 7 per cent per year for 15 years, and recycled the revenues to industry and households, would not damage competitiveness. At the same time, it would cut energy consumption by 21 per cent, create over half a million jobs and favour the poor over the rich. However, opposition from heavy energy users in German industry has blocked progress so far.

32. Austria, where Greenpeace commissioned the same institute to examine the opportunities for ETR there, is looking to introduce energy taxes next year; Sweden, Denmark and Switzerland are also planning to extend the use of eco-taxes, on energy, and on toxic products such as solvents and pesticides.

33. Environmental groups needs to track this progress and share information both with each other and with the wider public.

G. The Greenfreeze Campaign

34. "The beauty of greenfreeze is that anyone can have the technology. It is not patented. It cannot be patented because all we have done is find the right mix of two existing common gases... The irony is that the chemical industry also searched for a substitute to CFCs but only in one direction - to find substances they could patent"

-- Scientist at Dortmund Institute of Hygiene who developed a prototype greenfreeze, 1990

35. Another way in which Greenpeace has contributed to spearheading cleaner production is in the development and promotion of the greenfreeze - a fridge which uses neither ozone-depleting CFCs and HCFCs nor the global warming chemical HFC. The fridge uses a mixture of relatively benign hydrocarbons: butane and propane - used widely in refrigeration before the advent of CFCs in the 1930s. Greenfreeze is a development beyond environmental protest which illustrates how environmental groups can campaign to change the markets for products.

36. The greenfreeze campaign is a story of an alternative technology which governments ignored and industry tried to stop. Without the action of Greenpeace, the world would be on

a different course, heading for a future in which millions of consumers and businesses would be using chemicals which destroy the ozone layer (HCFCs) and which cause global warming (HFCs).

37. Greenfreeze shows how it is possible for an environmental group to take a new form of direct action, one which harnesses the expertise of technologists to the political and market power of consumers to force change where conventional campaigning is not enough. Before greenfreeze, government policies all over the world were locked in the grip of the chemical industry. The same industry which created CFCs was dictating HCFCs and then HFCs as the 'solution' to the problem.

38. Within two years over half of all Western European refrigerator production was using greenfreeze technology. Greenpeace also campaigned in Latin America, India and China. The first Chinese greenfreeze was due to roll off the production line in February 1995 at Qingdao's factory, a major Chinese fridge producer.

39. The greenfreeze campaign shows that genuine change is possible, and that even powerful industrial strangleholds can be broken.

H. Campaigning for a Chlorine-free planet

40. The elimination of chlorine use is another Greenpeace campaign goal. Chlorine is a poisonous gas used in many different industrial sectors creating environmental and health hazards throughout its entire life cycle. It is used in the production of an enormous class of some 11,000 organochlorine chemicals - from pesticides to solvents and bleaching agents - most of which are toxic, persistent and bioaccumulative.

41. The first stage of the campaign has been the stigmatisation of chlorine to raise public awareness of its hazards. The second stage is to force the change to alternative chlorine-free technologies and products.

42. To highlight the alternatives to chlorine bleaching in the pulp and paper industry, Greenpeace released a chlorine-free version of the popular German magazine 'Der Spiegel'. Today Soedra Cell, a Swedish company which owns six pulp mills in Sweden is committed to going totally chlorine free by 1996.

43. Greenpeace is now targetting the dry cleaning and PVC industry. Several different types of 'wet cleaning' are available as alternatives to perchloroethylene-based dry cleaning. As for PVC, the chlorine industry sees PVC as the "sink" for excess chlorine due to the drop in its demand in other sectors. Alternatives to all current uses of PVC exist.

44. The chlor-alkali industry clearly recognises the move away from the use of chlorine. Today it is striving to protect its markets and capital by waging a public relations war, fighting further regulation, and expanding markets where environmental regulations and enforcement are less stringent, public awareness is low and the economies are weak.

II. INTERNATIONAL NGO NETWORKING

45. The globalisation of trade and investment, as the case of chlorine industry migration demonstrates, demands increased international NGO networking. The uneven progress in the development and enforcement of environmental standards throughout the world provides an outright inducement for the transfer of harmful technologies and products.

46. The situation in countries with economies in transition is typical of that in most developing countries who are opening up to foreign trade and investment. The type of development being foisted on the non-OECD world is the misguided Western resource-intensive model. Networking between Western NGOs with those in countries receiving the inappropriate investment can alert the public and stop such proposals from going ahead. NGOs in the non-OECD need to point to traditional, often more environmentally sustainable practices in their countries.

47. NGOs in the developed countries need to expose the double standards of TNCs (transnational corporations) and the use of public funds by MDBs (multilateral development banks) or in bilateral aid programmes to finance such investment. International NGO networking can use the power of information exchange to inform their public, decision-makers and financing institutions of alternative cleaner technologies and strategies being developed by western governments to move towards clean production.

A. Greenpeace campaigns in Central and Eastern Europe

48. The Greenpeace toxic trade campaign in Central and Eastern Europe (CEE) illustrates the way that international NGO networking has been exposing dirty trade and investment and promoting the opportunities for clean production.

49. Greenpeace believes that the situation in CEE provides an immense and unique opportunity for the region to "leapfrog" the West by implementing only the most successful global environmental strategies, including cleaner production, and avoiding those that are clearly failing in the West.

50. New investment ventures in CEE offer opportunities for unprecedented democratic participation in investment decisions, and industrial and agricultural restructuring allow for a transition to Clean Production methods.

51. However, this new climate also presents causes for concern. The dangers include:

(a) The transfer of industrial and nuclear technologies, services and products which have been rejected and may soon be phased out in the West. These may be rationalised by both the need for economic growth and the argument that they may be better than that which now exists;

(b) The region becoming a resource bank to feed the West's wasteful consumption patterns;

(c) The adoption of reactive pollution "control" technologies rather than preventing pollution at source using cleaner production methods.

B. Waste Trade

52. In 1990 Greenpeace released a report "Poland: The Waste Invasion", exposing the trade in waste from Western Europe, mainly Germany, to Poland. This resulted in Poland strengthening and enforcing a waste import ban. Further reports, press conferences and "return to sender" actions in other countries of the region resulted in national waste import bans.

53. At the same time, Greenpeace was lobbying Governments and highlighting the issue in countries exporting waste. Besides being immoral - and often illegal - waste exports from developed, waste-intensive countries are one of the biggest obstacles to the introduction of cleaner technologies by reducing their waste disposal costs and removing any incentive to prevent waste generation.

54. After seven years of Greenpeace campaigning worldwide, the Basel Convention finally banned waste exports destined for dumping from OECD to non-OECD countries in 1994, and a ban on waste exports for recycling is to come into force in 1998. The Basel Convention also commits parties to the convention to co-operate internationally on the development of low-waste technologies.

C. Providing Remedies

55. In 1991 at a conference on the environment, industry and investment in CEE, Greenpeace was already warning the countries of CEE of the threats that foreign trade and investment can pose[1]. Two years later, Greenpeace released a report in Poland entitled "Open Borders: Broken Promises" presenting a set of model contractual clauses to encourage clean investment, by ensuring public disclosure and participation in the privatisation process - particularly in the sale of State-owned enterprises.

56. In 1994, on the eve of UNEP's Cleaner Production Seminar in Warsaw, Greenpeace released a report entitled "Poland: The Green Tiger of Europe? Clean Production - The Only Way Forward". The report presented the opportunities for moving toward Clean Production offered by economic, legislative, political and industrial restructuring and described cleaner production programmes and local initiatives in Poland.

57. The "Green Tiger" report also examined foreign aid and investment to Poland. It highlighted some of the best examples of environmental sector aid projects, and gave examples of the some of the worst, expensive end-of-pipe technologies being imported. In particular, the report criticised flue gas desulphurisation and waste incineration, both of which attempt to treat pollution after it has already been generated and often create more problems than they solve. The case study of the waste incineration campaign presented later describes how international NGO networking has succeeded in stigmatising this technology.

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[1] "Avoiding Western Mistakes: A Guide to Clean Investment in Central and Eastern Europe" Greenpeace, Budapest, November 1991

58. The report recommends that Western investment should support the region's positive environmental traditions - instead of undermining them. These traditions include an efficient public transport system and effective re-use and recycling policies. The transfer of the misguided Western model of development places an over-emphasis on pollution control over pollution prevention, roads over railways, chemical intensive agriculture over organic systems and disposable over re-useable packaging.

59. The Polish government has declared 1995 to be the Year of "Cleaner Production".

D. The Waste Incineration Campaign - A Case Study in global NGO Networking

Networking: North America - Western Europe

60. Public opposition to waste incineration has proved to be one of the biggest incentives to pollution prevention by rejecting this end-of-pipe treatment technology as a final solution to waste generation.

61. The grassroots movement to oppose waste incineration started in the 1970s in North America as awareness of the dangers of incineration became evident. This movement was fuelled in part by the issue of environmental justice, since a high proportion of toxic dumps, incinerators and hazardous industries were sited in poor, non-white communities.

62. Increased awareness of health problems from incinerator emissions has strengthened this resistance. Communities living downwind from incinerators were found to have a higher incidence of eye irritations, emphysema, pneumonia, asthma, allergies and neurologic symptoms. Cattle have died from direct exposure to a pharmaceutical incinerator in Ireland. These are the observable effects -- the chronic and reproductive effects of dioxin and heavy metal emissions from incinerators are more insidious.

63. Similarly the effects of incineration at sea - a disposal route for industrial, chemical waste used between 1969 and 1991 - raised concerns about effects on the ocean microlayer, as well as recognition that this was a disincentive to industrial waste reduction.

64. Greenpeace started a campaign against this in 1982. The campaign's three objectives were to:

(a) stop the use of the world's oceans for dumping industrial, chemical waste;

(b) target toxic waste generation as the source of the waste crisis and its elimination as the only solution;

(c) block the spread of another polluting disposal technology which results in the perpetuation and legitimisation of wasteful and hazardous industrial practices.

65. By 1986 a U.S. coalition of politicians and public groups succeeded in getting ocean incineration banned. This provided the necessary fuel to fire the campaign in Europe. In 1985, 1986 and 1987 Greenpeace published several critiques on ocean incineration, highlighting the fact that ocean incineration discouraged the development of waste reduction technologies and that its availability perpetuated waste generation.

66. The dissemination of this information, and Greenpeace actions aimed at forcing incinerator ships back to port, served to expand the network opposing ocean incineration. Environmental groups were joined by the National Union of Seamen in the UK and the National Federation of Fishers in Denmark as well as local communities in England and the Netherlands who successfully defeated proposed expansions of port storage facilities for hazardous waste destined for ocean incineration. A new European network was born. Finally the Second International Conference on the Protection of the North Sea agreed to end ocean incineration by 1995. The practice actually stopped in 1991.

67. The opposition to land incineration has resulted in the defeat of numerous incinerator proposals and the introduction of moratoria on the construction of new facilities, particularly in Western Europe and North America.

Networking: North - South

68. The success of this campaign in the West must not result in waste incineration technology moving South and East. Western NGOs bear a responsibility toward their eastern counterparts in alerting them to the threats, providing information and supporting them in their campaigns for Clean Production.

69. Western companies promoting and selling incineration technologies are today aggressively seeking new markets. Ideal candidates are those communities already burdened with historical waste, where environmental awareness is low, democratic structures are fragile and the economy is weak.

70. The countries of CEE fulfil all of these criteria. When the borders to the West were opened in 1989/90, western waste and incinerators were some of the first "commodities" to be offered. Although most CEE countries now have waste import bans, the threat of widespread transfer of incineration technology to the region remains.

71. Investment in waste incineration follows the pattern of other end-of-pipe, so-called "environmental" technologies. Because waste incineration is considered to be an "environmental industry" it qualifies for international assistance.

72. The transfer of misguided concepts and strategies tends to precede the transfer of inappropriate technology. The industry's entrance into CEE is the culmination of a three-stage process of exporting toxic industrial development:

- first, economic "development" is exported through free trade policies and financing by multilateral and bilateral agencies;

- secondly, environmental regulations to control the excesses of this development are introduced;

- finally, "environmental" technology and services are exported to service these regulations.

73. In this way, regressive and toxic technology is being thrust on these countries, assisted in many cases by Western government funding and proposed by their domestic companies. At the same time, foreign consultants, often paid out of so-called aid money, advise the region's governments on environmental policy that favours **waste management**, including incineration, over **waste prevention** through clean production.

74. For example, Greenpeace has yet to hear Danish waste consultants recommending that CEE countries ban the use of aluminium cans as their government has done at home. Instead of promoting waste reduction strategies, Danish 'experts' recommend various waste management technologies, including waste incineration.

75. Today there is a global coalition of NGOs fighting incineration with strong regional networks in CEE and Latin America. In Poland, the Waste Prevention Association has released a report entitled "Western Pyromania Moves East" which details 170 proposals to import waste incinerators to countries with economies in transition. The report not only provides information about alternative waste disposal technologies but also describes case studies of Polish factories which have changed their industrial processes to prevent or reduce incinerable waste streams.

III. WORKING WITH NATIONAL AND INTERNATIONAL INSTITUTIONS

76. While political and market pressures alone can bring about industrial change in a given country or region, clearly that is not enough to bring global change. The globalisation of trade demands international coordination at an inter-governmental level. Banned technologies and products, phased out or stigmatised in one country, should not be transferred elsewhere.

77. The task of international and national governmental organisations is to support environmental NGOs by creating a level international playing field. Urgent global action is necessary in a number of key environmental issues including: environmental liability, the transfer of hazardous technologies and products, common standards on EIAs and audits - to name but a few. International agreements could also secure for the public the right to look into investment decisions via steps in the investment screening process, to allow for public scrutiny.

78. EU attempts at harmonisation of standards and enforcement practices could provide a model, if the Commission, bowing both to national government and industry lobbying pressures, did not stoop to the lowest common denominator.

79. International commitments on their own, are not enough. Enforcement must follow. The Greenpeace waste trade campaign alerted the public to this scandalous trade and succeeded in getting individual non-OECD governments to implement waste import bans. However it was the Basel Convention that finally banned this practice worldwide. But who will police this ban?

80. The Montreal Protocol in committing governments to phasing out ozone-destroying CFCs opened up the search for alternatives. The vested interests of the chemical industry

attempted to steer this search in the direction of patentable alternatives. International conventions should not only provide commitments to phase-outs, but also point to acceptable alternatives, and blacklist others.

81. The International Ministerial North Sea Conference in June 1995 declared that parties should strive to achieve close to zero concentrations of all man-made synthetic substances in the North Sea within one generation (25 years). Who will monitor the progress towards this laudable goal?

82. International conventions have an important role to play in getting global agreements. However, unless some form of an international eco-police force is created to monitor compliance, these global commitments become meaningless.

83. Another urgent need identified by many non-OECD governments is for an up-to-date databank of cleaner technologies. Although UNEP's Industry and Environment Programme has a Cleaner Production database, much of the information is old and none of the technologies are vetted by independent assessors. What is required is an international databank of industrial innovations, regularly updated and all information checked by independent experts. Such a databank could be compiled by universities. It could be part of a larger institution, staffed by engineers and other experts, which provides information on cleaner production, tracks foreign investment and provides free advice to non-OECD governments.

IV. CONCLUSIONS

84. "Pollution Control always costs money; Pollution Prevention always saves money"
-- motto of the Cleaner Production programme in Poland

85. Opportunities for cleaner production exist worldwide. Many of the more progressive advances such as technological innovations, product re-design, creative policies and strategies are taking place in the Western world.

86. However a major obstacle to their widespread use and implementation is industry's need to amortise existing pollution control investments. Once a factory invests in a waste-to-energy incinerator, it has little incentive to reduce waste. The vested interests of the enormous "environment industry" - from waste management to pollution control equipment - are another negative force, although these barriers may be overcome with the widespread introduction of eco-taxes and take-back laws.

87. The so-called developing world and the former eastern bloc do not yet have these prime disincentives to cleaner production. Even though Western "aid" is funding some investment in end-of-pipe technologies and encouraging national governments to do likewise, finance is limited - so limited, that their only real choice is pollution prevention. After all, pollution is wasted resources. The Third World cannot afford to go the route of the Western one.

88. In CEE, cleaner production projects repeatedly demonstrate that pollution prevention saves money. In Poland the four year experience shows that 20-25% reductions in emissions

are possible with little or no money. Improvements in housekeeping and the installation of in-house recycling and recovery systems are the most common cleaner production measures. The skilled workforce in the CEE countries makes opportunities for Clean Production there particularly bright.

89. For cleaner production to progress beyond housekeeping and process change, the 'developing' world must have access to international databanks. Global networks between academics from all disciplines must be strengthened. It is also important that scarce domestic funds in the South are not sunk into expensive, pollution control and other obsolete investments, diverting capital away from cleaner ones.

90. Another factor crucial to cleaner production is democracy. The regions where there is rapid investment, and some democracy, offer the best scope for cleaner production. Trade unions and occupational health and safety authorities need to become more proactive in promoting cleaner production. Preventing the hazard at source eliminates the danger. Many cleaner production projects have shown shop floor employees, who are closest to the production, to have contributed some of the most creative innovations.

91. A global approach to tackling environmental problems offers every country the opportunity to introduce cleaner production. A level environmental playing field reduces the threat of inappropriate or obsolete investments.

V. RECOMMENDATIONS

All policy makers must actualise the Precautionary Principle by developing strategies and policies for cleaner production which actively integrate public participation.

Governments must facilitate full and detailed public access to information about industrial emissions, waste transfers and product development. The international Pollutant Release and Transfer Register must detail all chemical use and mass balance audits to enable a fully informed dialogue between communities, government and industry

Governments must introduce economic and legislative policies to encourage cleaner production initiatives.

Every industrial facility should undertake a mass balance audit to identify production inefficiencies and opportunities for cleaner production. Technical advice for SMEs to undertake this work should be government-funded. Results of the audits should be made public.

An international body should draw up a list of technologies and products that need to be phased out globally.

An international body of independent academics should prepare a database of cleaner production alternatives to hazardous technologies and products.

An international eco-police needs to be established to monitor implementation of international agreements.

Funding must be made available to NGOs and community groups who actively promote cleaner production alternatives.

International networking between NGOs must be facilitated. It is the most cost effective information dissemination tool that can deliver real change.

Annex I

CLEAN PRODUCTION DEFINITION AND CRITERIA

Clean Production systems for food and manufactured products are:

- non toxic;
- energy efficient;
- made from renewable materials which are routinely replenished and extracted in a manner that maintains the viability of the ecosystem and community from which they were taken, or;
- made from non-renewable materials previously extracted but able to be reprocessed in an energy efficient and non-toxic manner;

Furthermore, products are:

- durable and reusable;
- easy to dismantle, repair and rebuild;
- minimally and appropriately packaged for distribution using reusable or recycled and recyclable materials.

Above all, Clean Production systems

- are non-polluting throughout their entire life cycle;
- preserve diversity in nature and culture;
- support the ability of future generations to meet their needs.

The life cycle includes:

- The product/technology design phase;
- The raw material selection and production phase;
- The product manufacture and assemblage phase;
- The consumer use of the product phase;
- The societal management of the materials at the end of the useful life of the product.

Annex II

TERMINOLOGY

UNEP's Cleaner Production programme has agreed the following definition:

"**Cleaner production** is the conceptual and procedural approach to production that demands that all phases of the life-cy le of a product or process should be addressed with the objective of prevention or minimisation of short and long-term risks to humans and the environment. A total societal commitment is required for effecting this comprehensive approach to achieving the goal of sustainable societies".

Strategies which are going some way towards Clean Production, are variously referred to as:

* waste minimisation;
* waste reduction;
* waste prevention/pollution prevention;
* low- and non-waste technology;
* cleaner technology;
* clean/cleaner production.

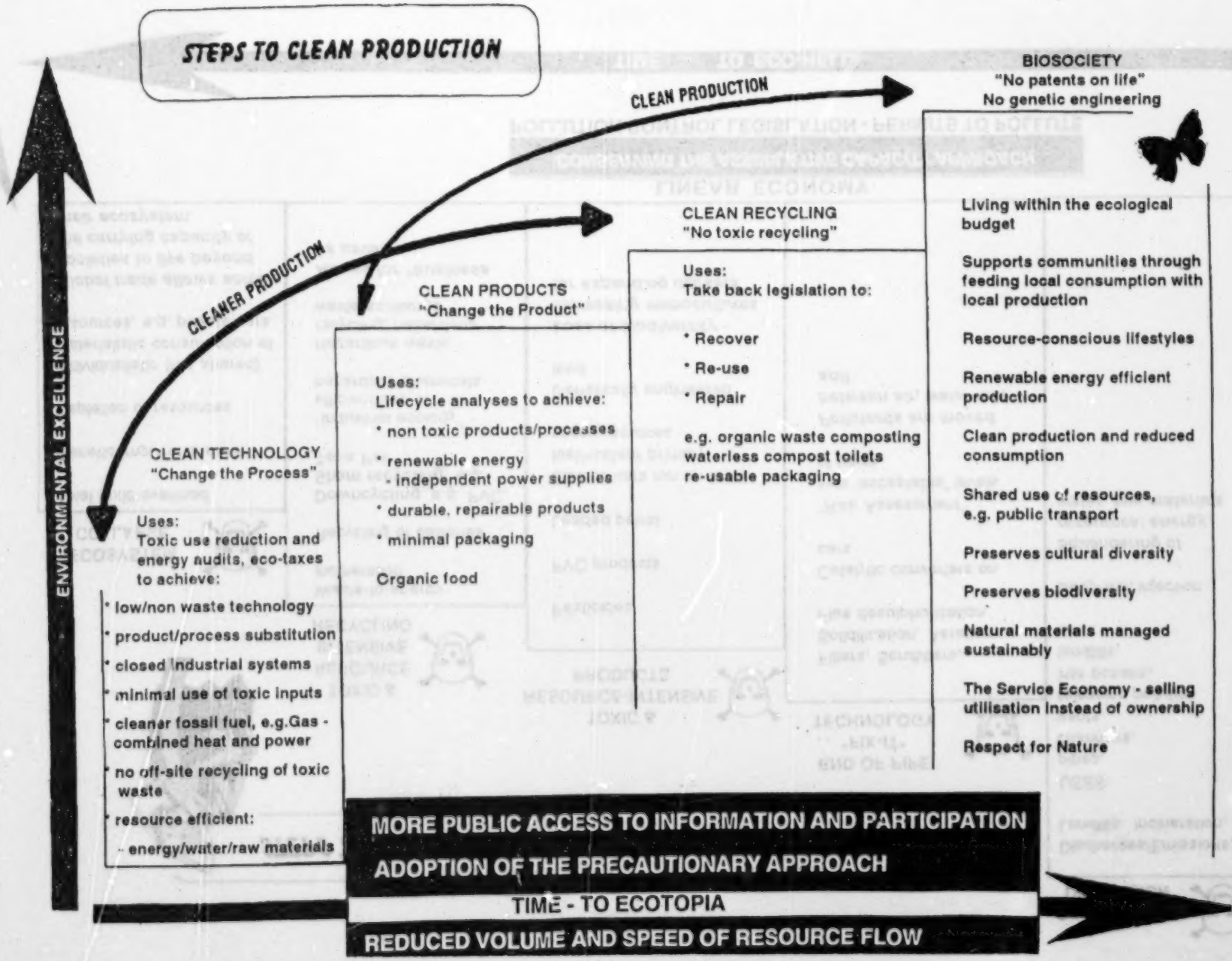
All these strategies have the common characteristic that they are not diluting/dispersing pollution, nor are they end-of-pipe in concentrating it and then transferring it to another environmental medium eg. from air to soil and groundwater.

UNEP has adopted the term "cleaner production" because they believe progress is relative and to emphasise the pragmatic nature of feasible alternatives that exist now.

Greenpeace and others use the term "clean production" because the ultimate goal and criteria are clearly defined. The definition also recognises the need to protect biodiversity and community viability since many of the substitutes being developed for current toxic chemical use could be genetically manipulated bio-based material. This must not be allowed to happen.

Annex III

BIOSOCIETY
CLEAN RECYCLING
CLEAN PRODUCTS
CLEAN TECHNOLOGY
THE PARADIGM SHIFT
DILUTION AND DISPERSION
END OF PIPE TECHNOLOGY
TOXIC & RESOURCE INTENSIVE PRODUCTS
TOXIC & RESOURCE INTENSIVE RECYCLING
ECOSYSTEM COLLAPSE
TO ECOTOPIA
TO ENVIRONMENTAL HELL
WHERE DOES YOUR COUNTRY STAND?


STEPS TO CLEAN PRODUCTION
ENVIRONMENTAL EXCELLENCE
CLEANER PRODUCTION
CLEAN PRODUCTION
CLEAN TECHNOLOGY
"Change the Process"
Uses:
Toxic use reduction and energy audits, eco-taxes to achieve:
* low/non waste technology
* product/process substitution
* closed industrial systems
* minimal use of toxic inputs
* cleaner fossil fuel, e.g.Gas - combined heat and power
* no off-site recycling of toxic waste
* resource efficient:
- energy/water/raw materials
CLEAN PRODUCTS
"Change the Product"
Uses:
Lifecycle analyses to achieve:
* non toxic products/processes
* renewable energy
- independent power supplies
* durable, repairable products
* minimal packaging
Organic food
CLEAN RECYCLING
"No toxic recycling"
Uses:
Take back legislation to:
* Recover
* Re-use
* Repair
e.g. organic waste composting
waterless compost toilets
re-usable packaging
BIOSOCIETY
"No patents on life"
No genetic engineering
Living within the ecological budget
Supports communities through feeding local consumption with local production
Resource-conscious lifestyles
Renewable energy efficient production
Clean production and reduced consumption
Shared use of resources, e.g. public transport
Preserves cultural diversity
Preserves biodiversity
Natural materials managed sustainably
The Service Economy - selling utilisation instead of ownership
Respect for Nature
MORE PUBLIC ACCESS TO INFORMATION AND PARTICIPATION
ADOPTION OF THE PRECAUTIONARY APPROACH
TIME - TO ECOTOPIA
REDUCED VOLUME AND SPEED OF RESOURCE FLOW

STEPS TO ECO-HELL

DEGREE OF ENVIRONMENTAL HELL

ECOSYSTEM COLLAPSE	TOXIC & RESOURCE INTENSIVE RECYCLING	TOXIC & RESOURCE-INTENSIVE PRODUCTS	END OF PIPE "FIX-IT" TECHNOLOGY	DILUTION AND DISPERSION
Total toxic overload	Waste-to-energy incineration	Pesticides	Filters, Scrubbers, Solidification, Aeration, Flue desulphurisation	Discharges/Emissions, Landfills, Incineration,
Genetic impoverishment	Recycling of batteries	PVC products	Catalytic converters on cars	*USES:* pipes, chimneys, vents, releasing pollution into oceans, landfills, air ...
Depletion of resources	Downcycling, e.g. PVC, Sham recycling, e.g. Tetra Pak	Leaded petrol	"Risk Assessment" sets "acceptable" levels of harm	Deep-well injection
Individualistic (not shared) materialistic consumption of resources, e.g. private cars.	"Industrial ecology" - efficient use of hazardous chemicals	Electric cars run on fossil fuel/nuclear primary energy sources	***Pollutants are moved between air, water and soil***	***Squandering of resources: energy, water, raw materials***
Global trade allows some societies to live beyond the carrying capacity of their ecosystem.	Hazardous waste recycling, hazardous waste exchange	Genetically engineered food		
	Allows for "business as usual"	***Loss of biodiversity - increasing monocultures for expanding markets***		

LINEAR ECONOMY

CONSERVING THE ASSIMILATIVE CAPACITY APPROACH

POLLUTION CONTROL LEGISLATION - PERMITS TO POLLUTE

TIME ... TO ECO-HELL